



CASE 1.—Sarcoma of the kidney. Weight, $2\frac{1}{4}$ pounds. Child, 2 years old. Perfect health 1 year and 8 months after operation.

SARCOMA OF THE KIDNEY; ITS OPERATIVE TREATMENT.¹

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IN this brief paper I shall not rehearse the ætiology, symptoms, diagnosis and prognosis of sarcoma of the kidney, as these have been carefully canvassed by Newman, Morris, Butlin and others, and about which there is a very general agreement. It is with the question of operation, its advisability and its technique, that this society has most practical interest.

Three operative cases which I shall put on record have instructive features which are worthy of attention. I will narrate them here.

CASE I.—*Sarcoma of Kidney Weighing Two and One-fourth Pounds, Child Two Years Old. Nephrectomy; Recovery; Perfect Health One and One-half Years Afterward.*—Julia D., a child of two years, was admitted to the Babies' Hospital (Fifty-fifth St. and Lexington Ave.) March 25, 1892. The baby had no ascertainable history of hereditary disease and was in excellent health until five months before admission. Then the mother noticed a small lump in the abdomen which had progressively enlarged. There had been no disturbance of the child's habits or functions, except for one day, three months before admission, when she had loose stools and bloody urine. This recurred once, for a day only, two weeks later, but had not been repeated.

The child had been taken to three of our largest hospitals and operation was refused.

When admitted her general condition was good. There were

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no evidences of disease in heart or lungs. Nutrition was well carried on and the child was not puny or emaciated, though not robust. Its complexion was pale, but not cachetic.

Examination showed an abdomen largely distended by a solid growth occupying its greater portion, crowding upward and spreading the ribs, causing the lower abdomen to sag and filling the right loin. The greatest circumference of the body was twenty-one and one-half inches. Examination under chloroform showed the surface veins somewhat enlarged. The right inguinal, lumbar, and hypochondriac regions were filled by a solid growth which crossed the median line to the line of the left nipple.

The outlines of the tumor could be distinctly defined. The colon resonance was advanced to the median line.

The urine examined revealed a trace of albumin, but no casts. Specific gravity, 1015; acid; no sugar; no blood. Diagnosis, by Dr. L. Emmet Holt and myself, was of sarcoma of the kidney.

For two weeks before operation the patient took milk diet, but nourished poorly. Pulse was at times irregular and she seemed weak and languid. She passed urine freely and was regular in bowels. The possibility of a successful operation, added to the strong desire of the mother that it should be done, in view of the hopelessness of the present situation, led me to do the nephrectomy as follows:

Operation April 12, 1892. The child was enveloped up to its hips in cotton, bandaged on, exposing only its abdomen and side. She was etherized and placed in Trendelenburg's posture at an angle of forty-five degrees. I was assisted by Drs. Fisk and Dunham. A transverse incision was made, eight inches long, over the prominent portion of the tumor extending from the lumbar muscle nearly to the median line. No peritonitis was found. Large veins stood upon the surface of the tumor.

The growth shelled out of its bed and a good pedicle was formed, which was tied with a silk ligature. There was very little blood lost, scarcely half an ounce, owing to the position. The anterior wound was closed by sutures; the posterior part packed with iodoform gauze. The operation lasted forty-five minutes and was well borne.

Milk and lime water were given during the night and thirty drops of whisky every two hours. She slept six hours and voided urine voluntarily. The temperature rose to 102° during the next day. Morphine was used to quiet restlessness and the stimulant continued.

In forty-eight hours the packing was removed, and everything went well from that time on. The stitches of silkworm-gut were left in the abdominal wall two weeks and the wound speedily closed. The child's health improved rapidly and nothing prevented a perfect convalescence.

The tumor was of irregular oval shape and weighed two and one-fourth pounds.

The pathologist's report defined it as a round-celled sarcoma, but a recent examination by Prof. E. K. Dunham, of Bellevue, shows it to be a carcinoma sarcomatosum.

The tumor of kidney from Julia Dollard (April 12, 1892) is one of a good deal of interest. In the tumor there are places where there are imperfectly developed tubules similar to, though not identical with, the renal tubules. There are also irregular patches and rows of cells, which I take to be epithelial cells. In between these masses of epithelium there is a connective tissue so rich in cells of various arrangement that it might well be regarded as sarcomatous. It is as though we had before us an adeno-carcinoma in which the stroma was formed of spindle-celled sarcoma. Now, I find in Orth's "*Compendium der Pathologisch-anatomischen Diagnostik*," Hirschwald, 1884, p. 317, a statement that such mixed forms of combined carcinoma and sarcoma do occur in the kidney (which he says is a favorite site for them). Boyce, in his "*Morbid Histology*," Appleton, 1892, begs the question as to nomenclature by saying, "Tumors of the kidney [primary] especially the larger ones, appear very frequently in fetal life or in early childhood. In addition to the remarkable cystic tumors . . . there are two very important classes, the adeno- and the myo-sarcomata. These tumors appear in one or both kidneys, and in a multiple form in either. The adeno-sarcomata, adeno-carcinomata, or congenital adenomata, as they are variously termed, consist either of solid epithelial acini (as in this specimen) or of tubes (as, imperfectly, in this specimen), papillomatous cystic formations and so-called pseudo-glomeruli, thus more closely resembling kidney tissue." [Page 278.]

It seems to me that the term "carcinoma sarcomatosum" (Orth), expresses the structures found in this tumor better than the terms employed by Boyce. In my sections the adeno-carcinomatous portions so predominated over the sarcomatous structures that I called the specimen simply adeno-carcinoma, thinking that the most important feature. I now qualify that diagnosis by mentioning the sarcomatous element in the specimen.

Yours very truly,

EDWARD K. DUNHAM.

The child, just a year and a half after operation, is in perfect health. A fine red complexion has replaced the sallow, almost cachetic one at the time of operation, and a careful examination fails to reveal any trace of neoplasm. The scar of the side is solid and surgically perfect.

The second case is one of unusual value, and is now presented for examination by the members of the society.

CASE II.—*Sarcoma of Kidney Weighing Seven and a Half Pounds, Child Weighing Fifteen Pounds, Aged One Year and Two Months. Nephrectomy; Recovery; Perfect Health One Year Later.*—Lucretta M., the child of healthy parents, with no hereditary history of tumors.

The child is still being nursed at the breast. Admitted to the Babies' Hospital November 20, 1892. Only six weeks before, the mother had noticed a slight enlargement of the abdomen, since which time the entire growth had taken place, with no symptoms, but a slight cough and a little loss of flesh during two weeks past. The bowel and kidney action has been normal. There had been no pain. The child maintained a good color, and had a normal temperature, though somewhat rapid pulse, 150, and respiration 56.

Examination by Dr. Holt and myself showed a rather hard solid tumor filling the abdomen, apparently growing from the right kidney.

The child was prepared with great care for the operation, which was done with the able assistance of Drs. Fisk and Dunham, in the presence of Drs. Holt, Kinnicutt, Draper, Frank Markoe and Northrup.

Operation November 20, 1892. The little patient was etherized and placed in Trendelenburg's position.

A small exploratory incision was made in the median line of the abdomen above the navel, and on introducing the index-finger it was swept about and confirmed the opinion that the whole abdominal mass was one tumor free from adhesions.

A long transverse cut was then made from the median incision around the right half of the abdomen to within two inches of the spine. The structures of the wall had been thinned out so that stout scissors cut the combined layers at once, with scarcely any loss of blood.

The surface of the huge tumor was traversed by large veins. The threatening aspect of these, many of which seemed stellate, as if they entered or emerged from the tumor, and must be beyond control during enucleation, almost called for the abandonment of the procedure at this stage.

The child having been turned on her side, and being inclined at more than forty-five degrees, it was evident when enucleation was com-



CASE 2.—Sarcoma of the kidney.

Weight, $7\frac{1}{2}$ pounds.



Nursing child aged 14 months, weighing 15 pounds after operation. Perfect health more than 1 year after.

menced at the least congested part, that light pressure would control the venous bleeding. The most bleeding occurred on the anterior surface on commencing its removal. One ounce was lost before it could be controlled. After that step the growth was separated from its cellular surroundings by finger-dissection, and sponge pressure stopped all oozing at once. A narrow pedicle was at last made, which was found to be double, one-half holding the vascular supply of the tumor with its cellular bed, and the other, when separated, holding the renal vessels and pelvis of the kidney. This was connected with a very pale kidney elongated to about five inches and throughout its entire length apparently normal in structure, except that at its upper end, it merged with the tumor, with which it had been completely removed from its bed in the loin.

Before ligating the double pedicle, critical examination showed that it was possible to amputate the kidney above its pelvis, leaving an inch and a half of apparently sound structure attached to the tumor.

This was, therefore, done, and a continuous suture of the kidney stump applied. The greater pedicle of the tumor alone was then ligated with silk and the kidney replaced in the loin.

Throughout the operation the patient lost not more than two ounces of blood, and, though under ether in all about an hour and a half suffered little shock. The abdominal wound was sutured with interrupted silk and silkworm-gut sutures, except posteriorly where a tamponade of iodoform gauze was applied.

The greatest care was given to sustaining the child's heart action by maintaining the inclined position not only throughout operation, but continuously for the succeeding day or two, the body being kept at an angle of thirty degrees. The added security, due to keeping the limbs swathed in cotton, to the liberal use of hot water bottles, to occasional hypodermics of brandy and strychnine, and, by no means the least, to enemas of hot black coffee—two ounces—at the end of operation brought the child through.

The child rallied beautifully; suffered no pain, and had normal functional action of kidneys and bowels during the entire convalescence.

The kidney wound healed without a drop of urine appearing at the drainage point. A few sutures were left in the abdominal wall for a fortnight. The day after operation the temperature rose to 105° , but quickly dropped to normal.

Convalescence was uninterrupted, and the child returned to its home in five weeks. Its nutrition subsequent to operation was its mother's milk.

Examination of the tumor showed it to be a dark massive lobulated growth, with the portion of kidney attached, its end spread out upon the tumor. The capsule was a continuous one upon the surface of each, and on section no capsule defined the growth from the kidney.

The limitation of tumor and kidney was fairly well shown on section; though they merged somewhat into each other, there was no apparent infiltration. Where the kidney section was made its structure was normal and far removed from any suspicious tissue.

The tumor weighed seven and a half pounds. The child, after operation, weighed fifteen pounds.

Microscopical examination made by the pathologist of the hospital, Dr. Waldstein,¹ and by Professor E. K. Dunham defined the tumor as a rhabdo-myo-sarcoma, containing a large portion of striated muscular tissue, mingled with round and spindle-celled sarcoma.

It would seem probable that the tumor grew in the capsule of the kidney, and, dragging the kidney from its bed, caused an extraordinary elongation, as it measured five inches long by one and a half in breadth.

CASE III.—*Sarcoma of the Right Kidney; Patient Aged Sixty-five; Nephrectomy; Death.*—The patient, Thomas L., an inmate of St. Luke's Hospital, presented an excellent illustration of a rapid-growing sarcoma of the right kidney.

The man was in active life up to five months ago when he began to lose flesh, and strength, and to have abdominal pain with frequency of micturition. Two months ago he began to pass blood in the urine and soon took to bed. These symptoms with the presence of an enlarging tumor in the side, continued up to the present.

Differential diagnosis from pyelonephritis, calculus hydronephrosis, etc., was easily made by the nature and feeling of the somewhat irregular ovoid tumor filling the right flank.

It was evident that if no attempt was made to remove the tumor, the patient would never leave his bed.

The condition was fairly presented to the patient and he solicited operation.

¹ Reported in the Path. Soc. Rec., N. Y. M. R., January 15, 1892.



CASE 1.—Perfect health more than 1 year and 6 months after operation.



CASE 2.—Perfect health more than 1 year after operation.

The liver was pushed forward by the tumor so that its free edge could be felt two-and-a-half inches below the ribs. No trace of glandular or other disseminated infection could be found.

The patient seemed in fair condition to bear operation if hæmorrhage was not too great.

The tumor extended from the ribs to the brim of the pelvis, could be well grasped by the hands, and had pushed the colon to the median line.

The tumor was somewhat tender to pressure.

The superficial abdominal walls were distended, as well as those of the lower extremities.

The urine was acid, specific gravity 1018, and had 2 per cent. of albumin with granular and hyaline casts, and a few red blood cells.

After a fortnight of treatment the albumin and casts disappeared from the urine and his strength improved.

Operation.—June 16, 1893.—The patient was placed in the usual semi-prone position for nephrectomy, and a transverse abdominal incision, ten inches long, made from near the spine parallel to and an inch below the twelfth rib. This gave excellent access to the tumor which was separated from its bed by finger dissection.

The bleeding was venous, almost entirely and readily controlled by sponges and clamps until the detachment of the tumor from the median line was reached when the entire mass tore through, close to the vessels and profuse hæmorrhage would have occurred had not quick sponge pressure been made, replaced by broad clamps which were left *in situ*.

The peritoneum was necessarily torn through, and the rent was sutured with catgut. The wound was sutured anteriorly and tamponed posteriorly, as usual.

The patient was rallied with hot coffee and brandy enema, and later large fluid enemata with brandy given. The pulse became full and strong, and he seemed to do quite well until twelve hours after operation when his powers flagged, and in spite of strychnine, digitalis and other stimulants he sank and died fourteen hours after operation.

Post-mortem Examination.—No sarcomatous infiltration infarctions or gland enlargements were found anywhere.

The opposite kidney and adrenal were normal.

In the walls of the operated cavity were some small remnants of neoplasm where the tumor tore away.

The vena cava, in the upper abdominal region, was distended with adherent clot, soft on the inside.

The lower part of the vena cava and both common iliacs contained old adherent organized thrombi, tunnelled along their sides.

This thrombosed condition was evidently caused by pressure and irritation of the growth and accounts for distention of the veins of the legs.

The pathologist's report (Dr. Thacher), upon the examination of the tumor, which weighed over three pounds, was, that it was of irregular surface, soft consistence, and in places was broken down.

Its color on section was reddish yellow and in parts nearly white. Microscopically it had typical sarcoma structure, the cells being of medium size, mostly round.

In these cases it does not appear that there was any hereditary disposition to tumors, and I think, generally, absurd stress is laid upon this consideration in making differential diagnosis. These tumors of the kidney present physical signs which more than in any other variety of growth explain themselves. The form, position, and manner of growth, their afebrile course, their firm feeling, mark them with distinct character. There is, it is true, in some of the rapid-growing sarcomas a deceptive sense of fluctuation, but to offset this a lateral enlargement or lobulated form give it an unmistakable stamp.

The differential diagnosis as to the variety of solid tumor, sarcoma or carcinoma is not possible, nor does it matter. A solid tumor is for all practical purposes malignant.

After its discovery these solid masses take on, in almost all cases, most rapid growth, and in a very few months, sometimes in weeks, attain great proportions. I know of no tumor anywhere in the body capable of so rapid growth. In children under ten they have, occasionally, been seen weighing thirty and in adults over forty pounds, and this growing within a few months. The largest tumor of the three recorded here, the tumor of seven-and-a-half pounds, was only six weeks in growing. Of the others, weighing about three pounds, one was eight weeks the other six months.

As to anatomical relation of the diseased growth to the

sound kidney, we are interested in view of the possibility of separating the two, as was done in one of my operations. Each case varies from others within such wide limits that one may find at one time a general infiltration of the kidney structure by sarcoma scattered so as to include small bits of renal tissue preserving their function, but not separable from tumor, with the mass built up in the shape of a kidney, grossly exaggerated. Or again the kidney may be whole and sound, but nestling in a depression of a large neoplasm, or entirely enveloped by new growth which, having started in the capsule, has spread in the cellular lymphatic spaces.

On the other extreme, the tumor may grow from a portion of one end of the kidney, as illustrated to-night, giving the surgeon an opportunity to preserve the greater part of the organ to the patient.

No similar case to this has before been reported, and it will at once be asked "Is it sound surgery to thus risk leaving a contaminated gland?"

This question was answered at the time of operation by a careful examination of the parts, which showed that no portion of the kidney except that immediately on the tumor partook in the slightest degree of the nature of the disease. The efferent veins from the tumor mass formed a group somewhat apart from the hilum of the kidney, and the lymphatics probably grouped themselves with these. The question whether the arterial supply of the tumor reached it through the kidney was of less importance than whether the return circulation was by that route.

Being satisfied by inspection that the tumor veins did not empty through the renal pedicle, I severed the kidney at a reasonable distance from the tumor (one and one-half inches) cutting through sound tissue (as proved afterward by microscopical examination), and felt safe that the track of usual systemic contamination had not been left.

No lymphatic glands could be felt anywhere in the mesentery, and it is quite possible that, large as the tumor was, its well-marked capsular envelope confined the essential cells of its growth, so that lymphatic infection had not as yet occurred.

Windle, Newman and others would have us accept the modern pathological view that these primary sarcomas must have existed in the renal substance from birth, even though they develop only in the latter part of life, as in my third case—being the result of inversion of embryonic cells originally. When their enveloping capsule once gives way the cells grow with enormous rapidity.

The question of the curability of sarcoma stands side by side with that of cancer, and as yet statistics show that only a few cases have gone beyond the three-year limit of time. One has lived five years. Barth, of Marburg, reports up to June 8, 1892, collected statistics of 100 nephrectomies for malignant disease, the largest yet gathered, of which forty-two died from operation, twenty died from metastases and thirty-eight were cured. The use of the word cured here cannot be accepted in its strictest sense.

Sigrist collected sixty-four, with thirty-two deaths from operation. Nine went a year and a half and had recurrence. Five went beyond two years and one continued well at four years.

The question of advisability of operation is not always the same as one of curability of the disease, either to the patient in whose breast the exhilarating sentiment of hope will always be found or to the surgeon who may yet hope to perfect methods and results which will alter the discouraging statistics.

If this were not so why do any of us continue to remove mammary cancers? Is not the improvement in operative work and results in malignant disease of the breast a sufficient reason why we should endeavor to improve the technique of nephrectomy, and save at least many of the 50 per cent. mortality from operation alone?

Even if the cured cases can be spared to three years of happy and useful life, as illustrated by Dr. Keyes' case, who enjoyed good health and was in active business, or if the children can be snatched from the grave to have the roses come back to their cheeks for a year or two to gladden their parents, it still seems to me a justifiable operation.

Two or three points in the operation are, in my experience, worth great emphasis.

The question of abdominal or lumbar incision will, I believe, trouble few members of this society. The size and position of the growth will largely determine the matter, and it is useless to gather statistics to show that opening the peritoneum has any inherent danger from the method of wound treatment to-day.

No surgeon now contemplates with anxiety a rent or an incision in the peritoneum during an operation, unless there is a pus cavity at hand. The greater mortality from intraperitoneal nephrectomies is probably due to that method being resorted to in tumors too large to be easily removed by the loin and, in themselves, more grave. "The real fact is," says Mr. Tait, "the kidney is best reached by the *most likely looking road*."

My own preference is for a straight incision from near the spine, parallel to the last rib, an inch below it, and continued as far as need be toward the median line, crossing the rectus abdominis if the tumor be large. Through such incision any renal tumor can be handled, and to be *safely* handled, ample room must be had.

The peritoneum will not be opened unless the tumor be large, and then it is better so.

The danger of a weak scar when the muscles and fascia are cut across is no greater, if they are properly united, than in cutting outside the rectus in Langenbuch's incision.

If asked my preference, I would say, "Always a cross cut."

Of much greater importance than the cut is the question of saving hæmorrhage—and here I believe will be made the greatest advance in the operation.

In Trendelenburg's position I believe we will find as great an aid for renal as for pelvic surgery. The two children I operated on thus, and with astonishingly light hæmorrhage. In the adult I unwisely adopted the usual nephrectomy position, and the profuse venous hæmorrhage and resulting shock had much to do, I fear, with the fatal result.

More than this. The position gives natural drainage of the tumor itself before removal, and I have little doubt that half a

pound or more of blood was saved to the patient's system by thus elevating the seven and a half pound tumor.

A mortality of 50 per cent. from operations implies profound shock, and this, I believe, is largely due to hæmorrhage. To combat this advise a hot black coffee and brandy enema at the end of operation, a large warm saline enema and strychnine hypodermics; maintaining warmth and the inclined position will also be always large factors for recovery.

In cases where a pedicle is not easily made, clamps should be secured and no ligature applied. The clamps must remain at least two days, as in case of clamps used on broad ligaments in vaginal hysterectomy.

T. Jones reports two cases with recovery where clamps were left on two and five days. It was necessary in my third case to use them, and I found them quick and easy to apply without traction on the pedicle.

Both Butlin and Thornton take a pessimistic view of the value of operation for sarcoma in children, and think it will fall into disrepute.

On the other hand, though recognizing the fatality of the operation, Koenig is more optimistic, and believes that surgery should make such advances as it can and look hopefully ahead.

I myself take this view, and believe the records can be greatly improved.

